

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A configurable voltage generator comprising:
 - an oscillator module for generating a pumping signal;
 - a digital to analog (D/A) converter coupled to the oscillator for generating an ~~one or more~~ analog signals signal of a predetermined voltage level based on the pumping signal as configured by a set of inputs thereof; and
 - a charge pump coupled to the D/A converter for producing a direct current (DC) output based on the analog signals generated by the D/A converter,
wherein said direct current ~~one or more~~ outputs are is configurable by adjusting the inputs of the D/A converter.
2. (original) The generator of claim 1 further comprising a load capacitor coupled to the charge pump for smoothing the output.
3. (original) The generator of claim 1 wherein the oscillator is a ring oscillator.
4. (original) The generator of claim 3 wherein the pumping signal is a square wave signal.
5. (original) The generator of claim 4 wherein a voltage swing of the square wave signal is within a predetermined operating voltage range.

6. (original) The generator of claim 1 wherein the charge pump is a negative charge pump for generating at least one configurable negative output to be used as a substrate-bias voltage for reducing leakage of a semiconductor device.
7. (original) The generator of claim 1 further comprising a recovery module for clearing the output before generating a new value.
8. (original) The generator of claim 1 wherein the D/A converter further includes an initial control module for initializing the D/A converter.
9. (original) The generator of claim 8 wherein the D/A converter further includes a code converter for transforming the inputs to a set of thermometer signals.
10. (original) The generator of claim 1 wherein the D/A converter is selected with a predetermined number of inputs based on a predetermined number of steps needed for the analog signals generated.
11. (original) The generator of claim 1 wherein the charge pump is a voltage doubler producing the output as a sum of a voltage output swing of the D/A converter and a supply voltage.
12. (currently amended) A configurable voltage generator for providing ~~a one or more~~ substrate-bias voltages for reducing leakage current, the generator comprising:
 - an oscillator module for generating a square wave pumping signal;
 - a digital to analog (D/A) converter coupled to the oscillator for generating ~~an one or more~~ analog signals signal of a predetermined voltage level based on the pumping signal as configured by a set of inputs thereof; and
 - a negative charge pump coupled to the D/A converter for producing a direct current (DC) output based on the analog signals generated by the D/A converter.

13. (original) The generator of claim 12 further comprising a load capacitor coupled to the negative charge pump for smoothing the output.

14. (original) The generator of claim 12 wherein a voltage swing of the square wave pumping signal is within a predetermined operating voltage range.

15. (original) The generator of claim 12 further comprising a recovery module for clearing the output before generating a new value.

16. (currently amended) The generator of claim 12 wherein the D/A converter is selected with a predetermined number of inputs based on a predetermined number of steps needed for the analog signals generated.

17. (currently amended) A method for producing one or more voltages by a configurable voltage generator for providing one or more substrate-bias voltages for reducing leakage current, the method comprising:

activating an oscillator module for generating a square wave pumping signal;

selecting a set of inputs to a digital to analog (D/A) converter coupled to the oscillator for generating an one or more analog signals signal of a predetermined voltage level based on the pumping signal; and

wherein a negative charge pump coupled to the D/A converter produces a direct current (DC) output based on the analog signals generated by the D/A converter as configured by the selected inputs.

18. (original) The method of claim 17 further comprising smoothing the output by a load capacitor coupled to the negative charge pump.

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19. (original) The method of claim 17 further comprising clearing the output before generating a new value.

20. (original) The method of claim 17 further comprising determining a desired substrate-bias voltage based on an optimal effect on the leakage current.